FROM the Report of the Somerset County Education Committee we learn that an experimental farm has been established under the auspices of the committee at Bickenhall, near Taunton, where systematic observations are made and experiments conducted on the breeding, feeding and produce of farm animals, more especially those usually found on a dairy farm. Experiments are also made on the production of various crops.

THE annual meeting of the Association of Headmasters of Higher Grade Schools and Schools of Science was held on Friday last at the rooms of the Society of Arts. Mr. E. J. Cox, Headmaster of the George Dixon Higher Grade School, Birmingham, delivered his presidential address, taking for his subject the recent return of the Board of Education, which gives statistics relating to schools of science in connection with board schools and certain conclusions which have been drawn from the return by a section of the Press. Mr. Cox, and the association over which he presides, maintain that these schools of science are providing a thorough and suitable preparation for boys who will later proceed to workshops and factories. Judging by the remarkable unanimity of the reports of the inspectors of the Board of Education, South Kensington, it may certainly be said that these schools provide the best preparation for the later work of the technical school to be obtained in this country. It is to be hoped that future legislation will provide a place in the national system of education for schools of this character, since they effectually ensure that the brightest children of the elementary schools shall receive practical instruction in the methods of science. It is a hopeful sign for the future of English education that several representatives of different trade societies were present at the meeting and showed by their speeches that they understood the value of a knowledge of science to all engaged in manufacture.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Astronomical Society, November 8.—Dr. J. W. L. Glaisher, president, in the chair.—Mr. S. A. Saunder read a paper on the determination of selenographic positions and the measurement of lunar photographs. This was a second paper on the subject, dealing with the determination of a first group of standard points on the moon, by measures made at the telescope and on photographs. Prof. Turner said this was a work in which those could assist who possessed telescopes of moderate aperture, as it had been found that very large apertures were unsuited for measures of the lunar surface.—Father Sidgreaves read a paper on the spectrum of Nova Persei from February 28 to April 26; with an appendix, dealing with its spectrum in August and September. Photographs were shown of the spectrum taken at Stonyhurst on August 27 and September 5, when it had become a bright-line spectrum, some of the lines remaining very broad and well defined.—Mr. A. R. Hinks gave an account of the experimental reduction of some photographs of Eros made at Cambridge Observatory for the determination of solar parallax; he explained the methods employed and gave some preliminary results.—Mr. H. C. Plummer read a paper on periodic orbits in the neighbourhood of centres of libration.—Mr. Bellamy read his paper on the place of the variable star RU Herculis and the neighbouring stars from photographic measures.—Prof. W. W. Campbell, Prof. J. Scheiner and M. Ch. Trépied were elected associates of the Society.

Linnean Society, November 7.—Prof. S. H. Vines, F.R.S., president, in the chair.—Mr. W. Botting Hemsley, F.R.S., on behalf of the Director of the Royal Gardens, Kew, exhibited the following specimens:—(1) A West Australian umbelliferous shrub, *Siebera deflexa*, which produces tubers, called *Yuke* by the aborigines, who eat them both raw and cooked. Many shrubs in dry countries form large tuberous stocks from which annual stems spring; but the tubers of *Siebera deflexa* grow in strings showing no trace of eyes or buds, but scars where stems may have been detached. Whether independent plants spring from the separate tubers is a question which remains to be determined. (2) Germinating seeds of *Araucaria Bidwillii*, received from Grahamstown. The peculiarity in the germination is that there are two distinct stages; in the first stage the radicle emerges from the shell of the seed, eventually bringing out the petioles of the cotyledons and the axis of the plantlet. The radicle grows into a carrot-shaped woody body, from which the petioles of the cotyledons disarticulate, leaving a few minute rudimentary leaves forming the point of the plumule. After some weeks the second stage begins with the elongation of the plumule, which eventually becomes the trunk of the tree. It appears that the second stage may be delayed a considerable time without loss of vitality. The germination of the seeds of *Araucaria Bidwillii* had been previously observed, and the process has been described and illustrated in Regel's "Gartenflora," 1865, p. 103; but the two stages of growth escaped notice. Another peculiarity is there pointed out: each seed contained two or more embryos, which germinated and grew so that 164 plants were raised from seventy-five seeds. *Araucaria Bidwillii* is the *Bunya-bunya* of Queensland, and the seeds were formerly an important article of food of the Australian aborigines. (3) A drawing of *Archidendron solomonensis*, a new pluricarpellary leguminous tree, native of the Solomon Islands, where it was discovered by Archdeacon Comins. In this instance there were three ripe pods developed from one flower; and it was explained that in the flowering stage there were usually eight carpels; but they probably rarely, if ever. all reach maturity. The genus Archidendron was founded on an Australian species, and since then several other species have been discovered in New Guinea and the adjacent islands. (4) A selection of South African species of Helichrysum showing the great diversity in habit, foliage and flowers displayed by this very large genus of Compositæ.—Dr. Rendle showed germinating seeds of *Crinum longifolium*, received from Mr. E. A. Bowles, as an example of the so-called bulbiform seeds which characterise this and some other allied genera of Amaryllideæ.—The president directed attention to a specimen of *Luzula nivea* from a cultivated plant of unusual dimensions.—Mr. Cecil Warburton, on behalf of Miss Alice Embleton and himself, read a paper on the life-history of the black currant gall-mite, *Eriophyes* (*Phytoptus*) *ribis*, hitherto very imperfectly known, and dealt particularly with its behaviour during the migration-period, which lasted from the middle of May to the middle of June. Its natural enemies and its relation to the red currant plant were also discussed.—Mr. C. B. Clarke, F.R.S., communicated some notes on the types of species of Carex in Boott's Herbarium.

CAMBRIDGE.

Philosophical Society, October 28.—Mr. J. Larmor, vice-president, in the chair.—Prof. A. Macalister was elected president for the session 1901–2.—Notes on minerals from the Lengenbach Binnenthal, with an analysis by Mr. H. Jackson, by Mr. R. H. Solly (see vol. lxiv. p. 577, October 10).—Some remarks on the notion of number, by Dr. Hobson.—The Hall effect in gases at low pressures, by Mr. H. A. Wilson. The experiments described in this paper were undertaken with the object of detecting and investigating the Hall effect in the positive column of the ordinary electric discharge at low pressures. A vacuum tube was constructed having two small electrodes 6·5 millimetres apart, attached to a stopper ground into a side tube, joined on at right angles to the main discharge tube. By rotating the stopper the two small electrodes could be made to lie both in the same equipotential surface of the positive column. The difference of potential between these electrodes was measured by means of a quadrant electrometer, and the stopper was turned until the electrometer deflection was zero. A magnetic field was then applied perpendicular to the line joining the two small electrodes and to the direction of the discharge. It was found that the field produced a difference of potential between the small electrodes which appeared to be a true Hall effect and was proportional to the magnetic field. In the uniform positive column this transverse potential gradient was found to be nearly independent of the current through the tube and inversely proportional to the pressure of the air in the tube. At 1 millimetre pressure the difference between the velocities of the negative and positive ions due to one volt per cm. was found to be $14 \times 10^4 \frac{\text{cms.}}{\text{sec.}}$.—On some problems in electric convection, by Mr. G. T. Walker. The paper deals with problems involving the motion of electrified particles through dielectrics which are themselves in motion relative to the ether. It is shown that if space on one side of an infinite plane be occupied by a dielectric and this medium be moving at right angles to its bounding plane, the determination of the electric and magnetic forces due to a point-charge possessed of a velocity

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in the same direction can be effected: the images are moving point-charges. Attention is drawn to the inequality of the action and reaction in some of these cases, and the results are shown to be consistent with expressions obtained for the energy of the field.—On some phenomena connected with the combination of hydrogen and chlorine under the influence of light, by Mr. P. V. Bevan. When light of sufficient intensity acts on a mixture of hydrogen and chlorine in equal proportions the first effect observed is an increase in the volume of the mixture. This is shown to be due to a rise in temperature caused by the heat evolved in the formation of hydrochloric acid. It is also shown that the fall in temperature of the gas mixture to that of the surrounding medium accounts for the observed decrease in volume after light ceases to act on the mixture.

MANCHESTER.

Literary and Philosophical Society, November 12.—Mr. Charles Bailey, president, in the chair.—Mr. W. B. Faraday showed a stone adze, one of several similar implements which have been found, from time to time, near Leek. He suggested a comparison with the Eolithic stone implements which were recently shown to the Society by Mr. R. D. Darbyshire.—Dr. Charles H. Lees described the Hampson air-liquefying apparatus presented to the physical laboratories of the Owens College by Sir Henry E. Roscoe. After explaining the principle on which the action of the apparatus depends, and describing the experiments of Joule and Thomson which led to the discovery of that principle, Dr. Lees gave a *résumé* of the present state of knowledge of the properties of liquid air and of other bodies when cooled down to the temperature of liquid air.

PARIS.

Academy of Sciences, November 11.—M. Bouquet de la Grye in the chair.—Extract from a letter of M. Jansson, noting the successful results of the eclipse expedition at Cairo (see p. 62).—On a new method of manipulating liquefied gas in sealed tubes, by M. Henri Moissan. Since solid carbonic acid can now be readily obtained, experiments were made with various liquids as solvents to see what temperatures could be reached, the evaporation being increased by a current of dry air. Of the liquids tried, methyl and ethyl alcohols, methyl chloride, aldehyde, acetic ether and acetone, the last named proved to be the best, a temperature of −98° C. being obtained by its means. If the current of dry air is previously cooled to −80°, the second mixture of acetone and carbon dioxide reaches −110° C. Details are then given of the best method of storing pure gases in the liquid form in sealed tubes, and of the precautions necessary.—On the action of the metal ammoniums upon hydrogen sulphide, by M. Henri Moissan. At a temperature between −75° and −70° liquid sulphuretted hydrogen reacts upon lithium-ammonium, giving a sulphide of lithium-ammonia and free hydrogen. The molecule $(NH_4)_n$, if it is produced in this reaction, is not stable at this low temperature and splits up into ammonia and hydrogen. The reaction with calcium-ammonium is similar.—On the origin of the starch in the grain of wheat, by MM. P. P. Dehérain and C. Dupont.—On the absence of electric displacement during the movement of a mass of air in a magnetic field, by M. R. Blondlot. The experiments described were undertaken with a view of deciding between two opposed theories. It was found that in air there is no displacement; this is contrary to the theory of Hertz on the electrodynamics of bodies in motion, but is in agreement with the theory of H. A. Lorentz.—On rational differential equations, by M. Edmond Maillet.—On the number of roots common to several equations, by M. A. Davidoglou.—A new method for the study of microphonic currents, by M. A. Blondel. The amplitude of the oscillations is increased by a suitable resonator, and a bifilar oscillograph used giving deviations of several millimetres for one milliampere. A diagram of the curves obtained with the five vowels accompanies the paper.—On the formation of ozone, by M. A. Chassy. A given volume of oxygen was submitted in an ozoniser to a current of known intensity. It was found that the law of increase of ozone was the same whatever the intensity of the electric current. A feeble current always produced the same effect as an intense current, provided that it acted over a time sufficiently long, or that the flow of the gas was sufficiently slow.—The application to man of the regeneration of confined air by means of sodium peroxide, by MM. A. Desgrez and V. Balthazard. A description of the improvements in detail of an apparatus previously described.

DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 21.

ROYAL SOCIETY, at 4.30.—On Skin-currents. Part II. Observations on Cats: Dr. Waller, F.R.S.—The New Biological Test for Blood in relation to Zoological Classification: Dr. G. H. F. Nuttall.—On the Inheritance of the Mental Characteristics in Man: Prof. K. Pearson, F.R.S.—Observations on the Cerebral Cortex of the Ape (Preliminary Communication): A. S. F. Grünbaum and Prof. Sherrington, F.R.S.—On the Process of Hair Turning White: Prof. E. Metchinkoff, For.Mem.R.S.

LINNEAN SOCIETY, at 8.—Report on the Botanical Publications of the United Kingdom as a Part of the International Catalogue of Scientific Literature: B. Daydon Jackson.

CHEMICAL SOCIETY, at 8.—On the Oxidation of Sulphurous Acid to Dithionic Acid by Metallic Oxides: H. C. H. Carpenter.—Optically Active β-hydroxybutyric Acids: A. McKenzie.—On the Hydrochloride of Thiocarbamide: H. P. Stevens.—The Constituents of the Essential Oil of *Asarum Canadense*: F. B. Power and F. H. Lees.—Note on the Reduction of Trinitrobenzene and Trinitrotoluene with Hydrogen Sulphide: J. B. Cohen and H. D. Dakin.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Presidential Address.

FRIDAY, NOVEMBER 22.

PHYSICAL SOCIETY, at 5.—(1) Multiple Transmission Fixed Arm Spectroscopes; (2) On the Measurement of Young's Modulus: Prof. W. Cassie.—Notes on Gas Thermometry, Part II.: Dr. P. Chappuis.

MONDAY, NOVEMBER 25.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Four Years' Travel and Survey in Persia: Major Molesworth Sykes.—Dr. Vaughan Cornish will exhibit a Cinematograph Representation of the Severn Bore.

SOCIETY OF ARTS, at 8.—Chemistry of Confectioners' Materials and Processes: William Jago.

INSTITUTE OF ACTUARIES, at 5.30.—The Case for Census Reform: G. H. Ryan.

TUESDAY, NOVEMBER 26.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—Exhibition of Palæolithic Implements from Savernake: E. Willett.—Exhibition of "Totem" Stones, collected by the Hon. A. Herbert: N. W. Thomas.—Dwarf Flints from the Sand Mounds of Samthorpe: Rev. R. F. Gatty.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Train Resistance: John A. S. Aspinall.

WEDNESDAY, NOVEMBER 27.

SOCIETY OF ARTS, at 8.—Leather for Bookbinding: Dr. J. Gordon Parker.

THURSDAY, NOVEMBER 28.

ROYAL SOCIETY, at 4.30.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.

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